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November 6, 2002
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TACKLING THE TEST AUTOMATION CHALLENGE: THE CENTRALIZED TEAM APPROACH

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RBC Financial Group
Dave Torresan

Dave Torresan is a Project Manager in the Enterprise Systems & Testing division of RBC Financial Group. His experience in software integration, testing and distribution dates to the early 90’s, with several years experience working for the municipal government, and then transitioning to the private financial sector. The focus of his career the past few years has been application set-up and test automation. He has made valuable contributions to the test improvement initiatives at RBC Financial Group, particularly with client/server integration for recent international acquisitions. He has also made great strides injecting test automation into RBC Financial Group’s test process. Dave holds project management and IT designations as well as a B.A. Degree.

A recognized leader in technology innovation and eBusiness, RBC Financial Group currently has more than 2.1 million active Canadian online customers. RBC has formed strategic alliances with industry leaders including Mediagrif Interactive Technologies Inc. and CashEdge, using new technologies to improve service and enhance value for its customers. RBC’s eBusiness products, services and technology infrastructure have been recognized for excellence in the external marketplace by a number of top industry technology and research firms including Gartner Group Inc., Forrester Research Inc. and Speers & Associates among others. For more information, visit RBC’s Web site at www.rbc.com.
Tackling the Test Automation Challenge: The Centralized Team Approach

November 6, 2002
Dave Torresan
Trivia 1
True or False

- Successful test automation means test plan design is no longer required?
Trivia 2
True or False

- Test automation can be successful without a previously established test process & test lab?
Trivia 3
True or False

- All application areas require their own test automation engineers?
Challenges...

- Many software combinations
- Many hardware qualifications
- Constant struggle with last minute business requirements
- Need a way to quickly verify
Pre-Requirements

- Choose automation product
- Choose tracking product
- Show preliminary successes
- Market successes
- Top down & bottom up support
- Write business case – show $$
- Present business case (handout)
“Other”
Pre-Requirements

- Test Lab / Workstation Build & Backup Process?
- Test Process
- Build the Team
- Team that’s already scripting, interfacing with groups
- Leverage out of “central” area
Who?

- At least 2 senior staff
- Recent graduates – contract
- Co-op education students
- 2 week learning curve
- If “Multi-talented”, bonus!
Recipe for Success 1 - Test Plans

- Solicit application groups
- Info gathering meeting
- Review & revise test plans
- Consultants if necessary
- Use tracking application
Recipe for Success 2 - Begin Automation

- Match test cases to modular script logic
- Commitment from Application Group
- 20/80 rule
Recipe for Success 3 – Demonstrations

- Demos, demos, & more demos!
- Invite project staff, management, executives
Recipe for Success 4 – Test Execution

- Begin execution – Integration, UATs, volume, stress, weekly production
- Post results to Web
- Remote testing
- NetMeeting for remote sites
Recipe for Success 5 - Tracking

- Quarterly Executive Update doc (handout)
- Post successes
- Change Management
- Apply Project Management practices
- Treat it like production!
Biggest Bang:

- Apps with many data entry fields, Excel input tables
- Many line of business PC profiles
- Many O/S & Application combinations
Demo Anyone?

- Live Demo by:

Jeff Beange
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Executive Summary

This document provides a summary of progress to date and future direction for “Project (Project Name)”. This project was initiated on (Insert date), after an executive proposal was approved to assist Client / Server application groups with test automation.

Project progress is tracked on a quarterly basis. This document covers the period inclusive from (Insert dates).
Document Information

File Title: 
File Name: 
Created: 
Last Saved: 
Last Printed:

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Edited By</th>
<th>Description</th>
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<td>Creation of Document.</td>
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<td>(Name)</td>
<td>Revisions based on feedback.</td>
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<td>Etc, etc…</td>
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Document Purpose

The main purpose of this report is to provide an overview of Project (Project name) with a status to date, issues tracking and a summary of future activities.

Document Store

This report is available from:
Project Manager

Distribution

ABC
Bob
Jeff

Related Documents

Proposal Doc
Presenations, etc

Key Contacts

The following table lists the managers related to the various processes in this document.

<table>
<thead>
<tr>
<th>Contact</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob</td>
<td>VP. Testing</td>
</tr>
<tr>
<td>Dave</td>
<td>Project Manager</td>
</tr>
</tbody>
</table>
1 Overview

1.1 Project Initiation

1.1.1 Project Marketing

There were several activities to market the kickoff for this initiative:

- A Lunch & Learn? Meetings/presentations?

1.1.2 Additional Contract Staff

1.1.2.1 Current Contract Staff Status

1.2 The Automation Approach

The following outlines the “recipe for success” used with the application groups thus far, and have produced outstanding results.

1.2.1 Approaching Application Groups

Describe how application groups were engaged with your team.

1.2.2 Information Gathering Meeting with Application

A preliminary meeting is held with the application groups to gather testing information about the application, specifically:

- Are test plans available?

1.2.3 Deliverables from Information Gathering Meeting

The following are various deliverables from this initial meeting:

- Test plan.
- Key Contacts list.
1.2.4 Test Automation Commences

Test automation commences only when a test plan suitable for porting into automation is delivered. Further describe how the automation is completed, and how application progress is tracked.

1.2.5 Demonstration to Application Group

Once a satisfactory level of test automation has been established, a demonstration is held with various stakeholders, including senior management.

1.2.6 Automated Test Execution in Release Test Cycles

During the test cycles, a resource is assigned to execute the automated tests in the various environments.

The results for the test runs are output to a text file and posted to the following web page: 
http://(yourwebpage).com

1.2.7 Document Projected Savings in Release Testing

A document is created to summarize the time savings for testing in a given release, as well as projected savings based on the results from this release.

1.2.8 Change Control for Test Scripts

Indicate how change control is handled. For example, this may be tied into the release signup process where a question may be asked as to whether the change in this release warrants a change to the automated test scripts. If so, your team is notified to make the change in advance.
2 Current Status – As of (Insert DATE)

The following section lists application groups that are currently working with the (your team name) Team on the initiative, have converted several regression scripts to automation or are awaiting automation.

The latest information can be obtained from the (tracking) application.

2.1 Work Complete

<table>
<thead>
<tr>
<th>Application – ONE TEST RUN</th>
<th>Manual Test Time (seconds)</th>
<th>Autotest Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.1 App1</td>
<td>1800</td>
<td>120</td>
</tr>
<tr>
<td>2.1.2 App2</td>
<td>220</td>
<td>40</td>
</tr>
</tbody>
</table>

As per the original project proposal and presentation, the approximate 4:1 ratio of manual to automated test time is consistent with the application testing automated thus far.

2.1.3 Release X Sample Results

The following charts illustrate projected savings based on the results of automated testing for release X.

2.1.3.1 Test Time Comparison

(Insert Manual vs Automated comparison chart here)

2.1.3.2 Savings for Automated Testing

(Insert Manual vs Automated resource savings chart here)

2.2 Work Outside of Project Scope

Identify any side projects outside of the initial project scope, such as assisting groups with test plan documentation, further automation beyond scope for stress testing, etc...
2.2.1  App Y Stress Test

2.2.2  App Z Test Plan documentation

2.3  Work in Progress
The following applications are currently engaged with the Automation Engineers for test script automation.

2.3.1  App A
- Provide a brief status

2.3.2  App B
- Provide a brief status

2.4  Awaiting Automation
The following application groups have been in contact with (your team name)

2.4.1  App C
- Provide a brief status

2.4.2  App D
- Provide a brief status

2.5  Work Completed vs. Projected

2.5.1  As of (Insert Date)

<table>
<thead>
<tr>
<th>Projected</th>
<th>Actual</th>
<th>Difference (Actual – Projected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 Client/Server Applications / Quarter X 2 quarters = 18</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>9 Host Emulation Applications / Quarter X 2 quarters = 18</td>
<td>17</td>
<td>1</td>
</tr>
</tbody>
</table>

Provide justification for any behind status applications, such as the out of scope work or resource constraints.
2.6 Where the Best Benefits are Being Realized

Provide scenarios where automation benefits are being realized.

2.6.1 Applications tested on Upgrade & Net New PCs

2.6.2 Applications that reside on Multiple Platforms

2.6.3 Applications with many data input fields
3 Financial Summary

The following outlines project costs to date and projected for the next quarter.

3.1 As of (Insert Date)

<table>
<thead>
<tr>
<th>Expense</th>
<th>Projected</th>
<th>Actual</th>
<th>Difference (Actual – Projected)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>Totals:</td>
<td></td>
<td></td>
<td>$</td>
</tr>
</tbody>
</table>

4 Issues Tracking

4.1 Outstanding

4.1.1 Issue 1

Issue

- Resolutions

4.2 Resolved

4.2.1 Issue 2

Issue

- Resolutions

5 Appendices
Automated Testing
Proposal DRAFT

Name
Division
Tuesday, 15 October 2002
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2. Executive Summary

As part of the (Insert team name) Team strategy to provide the best Software Release Build possible to the ABC Co. NT environment, it is critical to find a way of reducing the time spent testing and at the same time ensure that testing occurs in an efficient and consistent fashion. Additional infrastructure projects will inevitably lead to an increase in the number of distributed platforms within ABC Co. This reality will only provide more challenges to our ability to thoroughly test the systems we are delivering to the field.

In order to help address this problem, our proposal is to provide an automated testing tool to address the requests made of application and infrastructure groups to test basic system functionality against the next hardware platform or major infrastructure upgrade. In order to implement this proposal and take advantage of an automated testing tool, we will require assistance in writing and implementing “Automated Test Scripts” within our testing environments.

The tool that we are proposing to use for this project is (provide tool name & reasons why the tool was chosen, etc).

3. Project Objectives

The primary objective is to create automated test scripts for support of increasingly complex application/regression testing processes within ABC Co., to significantly reduce the time spent testing in the LAB environments, and to reduce the amount of resources needed to do so.

The reasons for this increased productivity and quality are:

- Each script can be written to provide the extensibility to run in each testing environment
- If the target application changes over time, one can easily modify the test procedures within the script; Scripts do not need to be rewritten.

4. Problem Definition

- Limited Testing Time Available
- Limited Staff Resources Available
- Planning and Communication Issues
5. Background

- Provide background challenges to the current testing model

6. Financial Summary

The proven time savings test automation can produce are summarized in the following examples. Example 1 illustrates the savings obtained from an application that has a Host Testing component, while Example 2 illustrates the savings in a strictly Client/Server scenario.

Example 1 – Host Regression Test – Application runs in Host Emulator

CASE 1a – Manual test effort

<table>
<thead>
<tr>
<th>Time Required for manual testing efforts</th>
<th>Business Analyst Cost – Env1</th>
<th>Business Analyst Cost – Env2</th>
<th>Business Analyst Cost – Env3</th>
<th>Cost across all Env. For One Appl. test</th>
<th>Total Cost – 36 executions per yr * 3 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 Min Per Environment</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$M</td>
</tr>
</tbody>
</table>

- Obtain full time resource costs from Project Office

CASE 1b – Automated test effort – Initial Conversion + Maintenance

<table>
<thead>
<tr>
<th>Time Required for automated testing efforts</th>
<th>Contractor Cost</th>
<th>Co-op Student Cost</th>
<th>Business Analyst Cost</th>
<th>Cost for conv. per Appl.</th>
<th>Cost for Maint/Oper per Appl.</th>
<th>Total Cost to Convert + maint. per application</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 hours</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$A</td>
</tr>
</tbody>
</table>

- Obtain full time resource cost from Project Office
- Research contractor & student resource costs

TOTAL SAVINGS over 3 YEARS = (Manual Test Effort – Automated Test Effort) = $M - $A = $S

If this is projected to 50 Host emulation applications, total 3 year projected benefit = $S X 50
Example 2 – Client/Server Application Regression Test

CASE 2a – Manual test effort

<table>
<thead>
<tr>
<th>Time Required for manual testing efforts</th>
<th>Business Analyst Cost – ENV1</th>
<th>Business Analyst Cost – ENV2</th>
<th>Business Analyst Cost – ENV3</th>
<th>Total Cost across all Env. For one Appl. Test</th>
<th>Total Cost – 36 executions per yr * 3 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 hours Per Environment</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$M</td>
</tr>
</tbody>
</table>

* Obtain full time resource cost from Project Office

CASE 2b – Automated test effort – Initial Conversion + Maintenance

<table>
<thead>
<tr>
<th>Time Required for automated testing efforts</th>
<th>Contractor Cost</th>
<th>Co-op Student Cost</th>
<th>Business Analyst Cost</th>
<th>Cost for conversion</th>
<th>Total Cost to Convert + Maint. per application – 3 yrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 hours</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$A</td>
</tr>
</tbody>
</table>

* Obtain full time resource cost from Project Office

* Research contractor & student resource costs

TOTAL SAVINGS over 3 YEARS for one application
= (Manual Test Effort – Automated Test Effort) = $M - $A = $S

If this is projected to 50 Client/Server applications, total 3 year projected benefit =

$S X 50

Provide Summary Here

7. Indirect Benefits

- Automated tests can also be run during off hours.
- Reduced time spent in the testing environments.
- Less hardware needed.
- More effective time management over the course of a business day, as tests can be completely user unattended.
- All actions performed by the test, and all reactions from the target application are recorded in a log, which can be reviewed later.
8. Conclusion & Recommendation

While cost estimates are considered to be reasonably accurate, it is difficult to pinpoint the exact breakdown in savings, due to uncertainties in estimating productivity. The analysis of savings is considered to be very conservative, and productivity and efficiency savings beyond the numbers listed are highly likely.

(Provide project recommendation and associated costs, scope & schedule here)

9. Appendix

Provide information on selected test automation tool